

Shielding Solid Steel Parts of a Vibration Test Stand
Against Alternating Magnetic Fields

367/105-59-3-8/27

institut (Leningrad Polytechnical Institute). The results obtained and the results advanced in this paper demonstrated that a shielding of iron cores by copper shields in installations as described here is very effective. A shielding of iron cores is particularly expedient for high frequency. The experiments carried out substantiated the correctness of the method advanced in this paper of the electromagnetic calculation of apparatus, which are similar to the electro-dynamical vibration test stand and which are equipped with a magnetic shielding against magnetic alternating fields. There are 7 figures, 1 table and 3 Soviet references.

ASSOCIATION: Leningradskiy politekhnicheskoy institut im. Kalinina (Leningrad Polytechnical Institute imeni Kalinin)

SUBMITTED: November 10, 1958

Card 3/3

FEDORISTOV, A.

Valuable contribution. Sov.shakht. 11 no.1:14 Ja '62.
(MIRA 14:12)

1. Nachal'nik shakhty imeni XXI s"yezda Kommunisticheskoy partii
Sovetskogo Soyuza tresta Krasnoarmeyskugol'.
(Donets Basin--Coal mines and mining--Labor productivity)

1. FEDORISTOV, A.M.
2. USSR (600)
4. Coal Mines and Mining
7. Means for increasing the productivity in opencasting of coal, Mekh.trud.rab. 7 no. 4, 1953.

9. Monthly List of Russian Accessions, Library of Congress, APRIL 1953, Uncl.

L 22125-65 ENT(1)/ENT(m)/T AFGL/SSD/AFMDC/ESG(s) I/P(c) ON

1. A. / Mechanism of ...

The use of scintillation counters ...

"APPROVED FOR RELEASE: 03/20/2001

CIA-RDP86-00513R000412610017-9

1 1 - 60

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SUB INTD: 00

ENCL: 00

SUB CODE: NP, EC

L 2544-66

ACCESSION NR: AP5021340

UR/0120/65/000/004/0111/0114
621.374

16
B

AUTHORS: Bragin, A. A.; Fedoriv, R. F.

TITLE: Sensitive discriminator with external control

SOURCE: Pribery i tekhnika eksperimenta, no. 4, 1965, 111-114

TOPIC TAGS: discriminator, transistorized circuit

ABSTRACT: The basic circuit for a sensitive discriminator (threshold, 10^{-3} - 10^{-1} v) with external control is described (see Fig. 1 of the Enclosure). Its application in radiometric devices appears promising; amplification of the output signal from a nuclear emission detector is unnecessary. The distinguishing feature of the circuit is that after triggering it does not recover its sensitivity independently but is forced to return to the initial state by external controlling pulses. The stable state of the circuit is obtained by the introduction of an additional negative feedback loop through a diode (D), so that the total gain in the feedback loop is less than 1. An analysis of the circuit sensitivity and a calculation of the thermal stability of the discriminator threshold are presented. Component parameters are given for the circuit as

Card 1/3

L 2544-66

ACCESSION NR: AP5021340

tested, and the experimental verification of the thermal stability is shown graphically. It was found that the discriminator threshold was about 35 mv and shifted by about 15% over the temperature interval of 20—60C. Orig. art. has: 20 formulas and 5 figures. [04]

ASSOCIATION: Fiziko-mekhanicheskiy institut AN UkrSSR, Lvov (Institute of Physics and Mechanics, AN UkrSSR)

SUBMITTED: 04Jun64

ENCL: 01

SUB CODE: EC

NO REF SOV: 004

OTHER: 003

ATD PRESS: 4109

Card 2/3

L 2544-66

ACCESSION NR: AP5021340

ENCLOSURE: 01

0

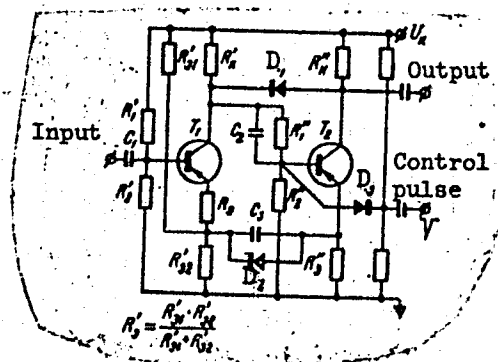


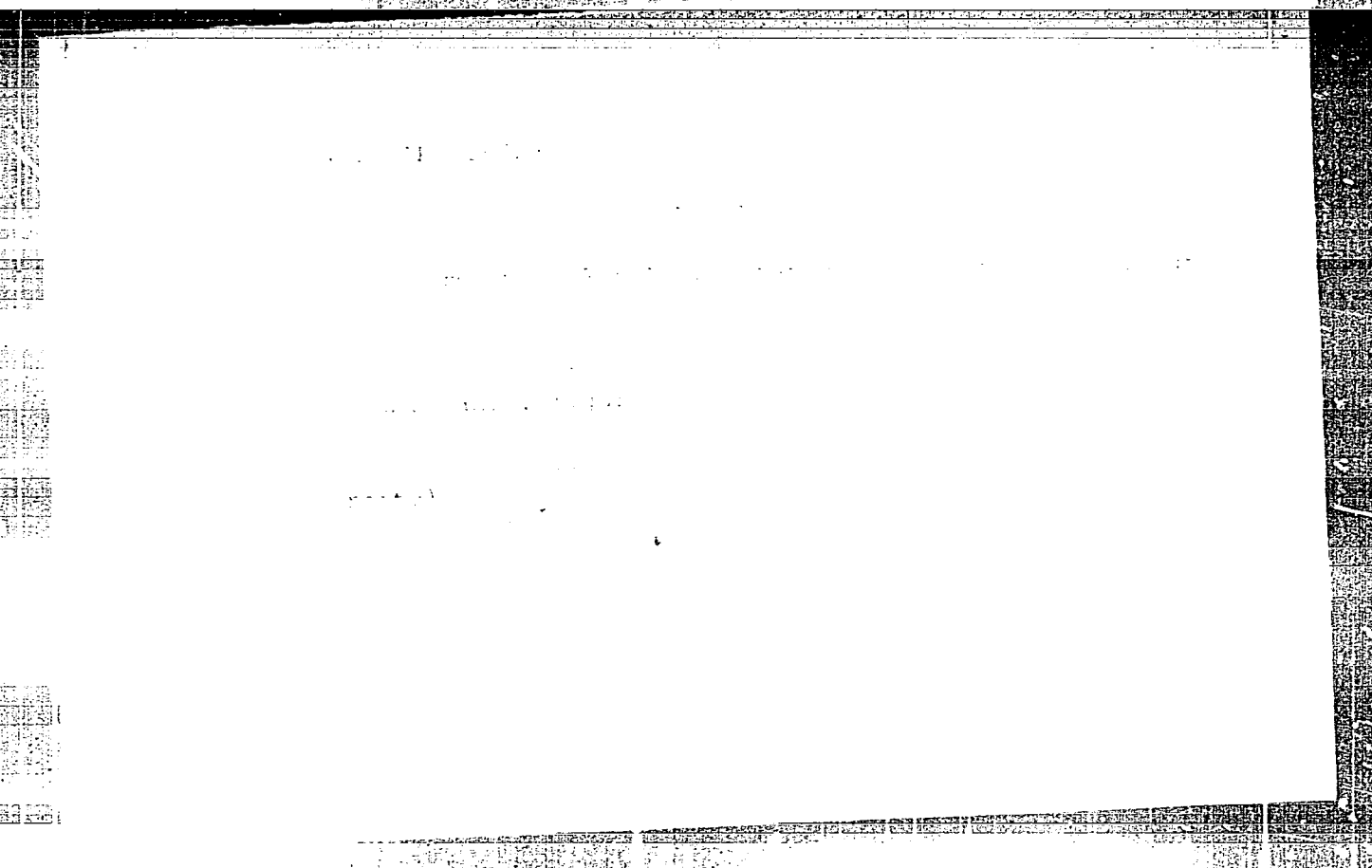
Fig. 1. Sensitive discrimination

Card 3/3 *md*

in quantum number of the valence band. The difference
in the difference in the electronegativity was neglected. It was

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CIA-RDP86-00513R000412610017-9"

KELOGLU, Yu.P.; FEDORKO, A.S.

Diagram of the pseudobinary section ZnSb - CdSb. Zhur. neorg.
khim. 9 no.8:1915-1919 Ag '64.

(MIRA 17:11)

... Petrovich: Fedorko, Anatoliy Stepanov ...

... their application in ...

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1. FORMATS AND DIRECTIONS

APPROVED FOR RELEASE: 03/20/2001

CIA-RDP86-00513R000412610017-9"

ACC NR:

AR7000862

SOURCE CODE: UR/0058/66/000/009/E030/E030

AUTHOR: Keloglu, Yu. P.; Fedorko, A. S.

TITLE: Properties of ZnSb-CdSb system

SOURCE: Ref. zh. Fizika, Abs. 9E246

REF SOURCE: Uch. zap. Kishinevsk. un-t. v. 80, 1965, 121-132

TOPIC TAGS: cadmium antimonide system, zinc antimonide system, zinc ^{compound} ~~antimonide~~, ~~binary system~~, ~~quasibinary system~~ cadmium compound, antimonide, phase diagram, thermomf, heat conduction, electric conduction

ABSTRACT: Based on a generalization of experimental material, a series of deductions are made relative to the structure and properties of alloys of the quasibinary ZnSb—CdSb system. A phase diagram of this system, constructed on the basis of data from thermal, x-ray, and microstructural investigations and from measurements of density and microhardness, represents a continuous series of solid solutions. The crystallographic group, configuration of the short range order and the type of chemical bonds in the solid solutions are the same as in binary components. It is noted, that besides the stable ZnSb—CdSb system, there also exists a metastable, temperature position of the liquidus and the solidus,

Card 1/2

ACC NR: AR7000862

which is different from that in the stable system. The study of such electro-physical properties as electroconductivity, thermal electromotive force, heat conduction carrier mobility, and carrier activation energy has shown the presence of the extremum of these properties in the ZnCdSb_2 alloy. Although x-rays do not show this alloy to have any structural peculiarities, the authors suggest that it should be considered as a ternary chemical compound, with calculated length of bonds: $\text{Zn}-\text{Cd}$ 2.93 Å; $\text{Sb}-\text{Sb}$ 2.81 Å; $\text{Zn}-\text{Sb}$ 2.65 Å; $\text{Cd}-\text{Sb}$ 2.81 Å. A bibliography with 93 references is included. I. Marchukova.
[Translation of abstract] [GC]

SUB CODE: 11,²⁰07/

Card 2/2

SOV/124-58-3-3030D

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 3, p 68 (USSR)

AUTHOR: Fedorko, P. P.

TITLE: Experimental Investigation of the Resistance and Convective Heat Exchange for Air Flow in Short Pipes at Low Reynolds Numbers (Eksperimental'noye issledovaniye soprotivleniya i konvektivnogo teploobmena pri dvizhenii vozdukha v korotkikh trubakh pri malykh znacheniyakh chisla Reynol'dsa)

ABSTRACT: Bibliographic entry on the author's dissertation for the degree of Candidate of Technical Sciences, presented to the Leningr. in-t inzh. vodn. transp. (Leningrad Institute of Water Transport Engineers), Leningrad, 1957

ASSOCIATION: Leningr. in-t inzh. vodn. transp. (Leningrad Institute of Water Transport Engineers), Leningrad.

Card 1/1

SOV/124-58-10-11251

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 10, p 79 (USSR)

AUTHOR: ~~Fedorko, P.P.~~

TITLE: Convective Heat Transfer and Drag in an Air Flow in Short Tubes at Small Values of the Reynolds Number (Konvektivnyy teploobmen i soprotivleniye pri dvizhenii vozdukha v korotkikh trubakh pri malykh znacheniyakh chisla Reynol'dsa)

PERIODICAL: Tr. Leningr. in-ta inzh. vodn. transp., 1957, Nr 24, pp 162-174

ABSTRACT: This is an experimental investigation of the convective heat transfer and drag for the flow of hot air in the initial section of a circular tube. The inlet-flow temperature was varied in the range of from 200 to 500°C and the tube-wall temperature was maintained constant at 100°C all along the length of the tube; the inlet into the tube was sharp-edged, the inside surface of the tube was technically smooth, and the relative length of the tube was equal to approximately 40 inside diameters. Experimental values of the drag coefficient and profiles of velocities and temperatures are given for isothermal and nonisothermal flow of air as well as the relationship of the Nusselt number to the Reynold number. As a result of free-flow currents allowed by

Card 1/2

SOV/124-58-10-11251

Convective Heat Transfer and Drag in an Air Flow (cont.)

the conditions of the experiment the flow developed into turbulence even at values of Reynolds number less than 10,000. Under conditions of nonisothermal flow of air the length of the initial hydrodynamic sector did not exceed 20 inside diameters, and the length of initial thermal sector was within the limits of 10-16 diameters, depending upon the value of Reynolds number. Data were obtained for determining the mean heat-transfer coefficient on the initial sector for different values of the Reynolds number and inlet air temperatures in connection with the design calculation of a short-tube heat exchanger.

A.A. Bodzholyan

Card 2/2

ARNOLD, Leonid Vladimirovich, prof.; FEDORKO, P.P., red.; VOLCHOK,
K.M., tekhn.red.

[Thermodynamics and heat exchange] Termodinamika i teplo-
peredacha. Leningrad, Izd-vo "Rechnoi transport." Pt.2.
[Heat transfer] Teploperedacha. 1959. 188 p. (MIRA 12:8)
(Thermodynamics)

FEDORKO, P.P., inzh.

Choosing the most efficient type of air preheater for small marine
steam boilers. Trudy LIIVT no.26:176-181 '59. (MIRA 14:9)
(Boilers, Marine) (Air preheaters)

FEDORKO, P.^p, kand.tekhn.nauk; PLATONOV, A., mekhanik

Automatic regulation of the temperature of cooling water in
marine diesel motors. Rech. transp. 19 no.4:28-29 Ap '60.

(MIRA 14:3)

(Marine diesel engines) (Automatic control)
(Temperature regulators)

FEDORKO, P.P.

PHASE I BOOK EXPLOITATION

SOV/4310

Arnol'd, Leonid Vladimirovich, Viktor Sergeyevich Markov, Vladimir Mikhaylovich Seliverstov, and Petr Petrovich Fedorko

Sbornik zadach po tekhnicheskoy termodinamike i teploperedache (Collection of Problems on Applied Thermodynamics and Heat Transfer) Leningrad, Izd-vo "Rechnoy transport," Leningradskoye otd-niye, 1960. 292 p. Errata slip inserted. 3,000 copies printed.

General Ed.: L.V. Arnol'd, Professor; Reviewer: P.P. Akimov, Docent; Ed.: N.V. Golovanov; Tech. Ed.: K.M. Volchok.

PURPOSE: This book is intended for students in water transportation institutions taking courses in thermodynamics and heat transfer. It conforms with the program of the Leningrad Institute of Water Transportation.

COVERAGE: The book consists of 501 problems on thermodynamics and heat transfer. It is subdivided into 16 sections. Each section gives a theoretical introduction, formulas, and one or more example of calculations. Twenty-three appendixes

Card 1/6

Collection of Problems (Cont.)

80V/4310

provide tables and graphs of thermodynamic values. Chs. 1, 4, 11, 14, and 15 were written by V.S. Markov; Chs. 3, 5, 10, 12, and 13 were written by V.M. Seliverstov, and Chs. 2, 6, 8, 9, and 16 were written by P.P. Fedorko; Ch. 7 jointly by V.S. Markov and V.M. Seliverstov. Chs. 4, 7, 11, 12, 13, 14, and 15 were written with the cooperation of I.V. Arnol'd. No personalities are mentioned. There are no references.

TABLE OF CONTENTS:

PART I. APPLIED THERMODYNAMICS

Sec. 1. Parameters of the Thermodynamic State of a Substance	3
Sec. 2. Fundamental Laws for Ideal Gases	7
Sec. 3. Mixtures of Ideal Gases	14
Sec. 4. Specific Heat of Ideal Gases	22
Sec. 5. First Law of Thermodynamics	29
Sec. 6. Thermodynamic Processes in Ideal Gases	35

Card ~~2/6~~

FEDORKO, Petr Petrovich; GOLOVANOV, N.V., red.; VOLCHOK, K.M., tekhn.
red.

[Automatic control of the temperature of cooling water in marine
engines] Avtomaticheskoe regulirovanie temperatury okhlazhdaushchei
vody v sudovykh dvigateliakh. Leningrad, Izd-vo "Rechnoi transport,"
1961. 61 p. (MIRA 14:10)
(Marine engines) (Automatic control)

FEDORKO, P., kand.tekhn.nauk

Temperature conditions in the cooling system of an engine. Rech.
transp. 20 no.5:22-23 My '61. (MIRA 14:5)
(Marine engines—Cooling)

FEDORHO, P.P., kand.tekhn.nauk

Thermal efficiency of heat exchangers under various operating
conditions. Trudy LIVT no.10:9-19 '61. (MIRA 14:9)
(Heat exchangers)

KUPRIYANOV, Dmitriy Fedorovich; TAREYEV, V.M., prof., retsenzent;
GOGIN, A.F., retsenzent; FEDORKO, P.P., red.; VOLCHOK, K.M.,
tekhn. red.

[Theory of internal combustion marine engines] Teoriia sudovykh
dvigatelei vnutrennego sgoraniia. Izd.2. Leningrad, Izd-vo
"Rechnoi transport," 1962. 288 p. (MIRA 16:1)
(Marine engines)

ANTONOVICH, Sergey Aleksandrovich; SHIFRIN, M.Sh., doktor tekhn.nauk, retsn.; MERKIN, D.R., doktor fiziko-mat. nauk, prof., retsn.; FEDORKO, P.P., red.; VOLCHOK, K.M., tekhn. red.

[Fundamentals of the theory of automatic control] Osnovy teorii avtomaticheskogo regulirovaniia. Leningrad, Izd-vo "Rechnoi transport," 1962. 367 p. (MIRA 15:7)
(Automatic control)

S/182/61/000/002/008/009
A161/A133

AUTHORS: Skuchilin, Yu.A., Fedorkevich, V.F.

TITLE: A unique sheet-stamping press

PERIODICAL: Kuznezhno-shtampovoye proizvodstvo, no. 2, 1961, 43 - 44

TEXT: The Voronezhskiy zavod tyazhelykh mekhanicheskikh pressov (Voronezh Heavy Mechanical Press Plant) has produced a "K383" 2,500 ton double-crank single-action press. It has been designed by SKB-10 for the cold-stamping of large oblong work and is intended for blanking, bending, piercing, shaping and embossing operations. Six hydro-pneumatic bolsters with a total of 500 ton clamping stress make it possible to effect shallow extrusion as well. The wide front is open, and work may be placed and removed along the entire front, while the press can also be employed for multiposition operations. The essential technical data are the following: Rated pressure - 2,500 tons; slide block travel - 500 mm; number of slide block strokes - 8 p.minute; maximum spaces between the slide block in bottom position and the table - 1,250 mm; die space adjustment range - 500 mm; space between pillars - 7,500 mm; table length (between pillars) - 7,500 mm; table width 2,000 mm; main drive - 125 kw; over-all dimensions in plane

Card 1/ 2

A unique sheet-stamping press

S/182/61/000/002/008/009
A161/A133

view - 10,300 x 3,600 mm; maximum height over floor - 8,800 mm; total height - 12,600 mm; weight - 530 ton. The frame is dismountable; The table, pillars and cross head are welded from 30 to 160 mm thick sheets by the electro-slag welding process. The weight of the largest all-welded parts is: cross head 86 tons, slide 60 tons, table 95 tons. The eccentric-gear drive is actuated by a 125 kw motor through belt and gear transmissions. All drive gears are enclosed in the crosshead. The high-speed (herringbone) transmission is in a closed oil bath, while the low-speed gears are lubricated by pouring. Clutch and brake are both of the two-disk friction type, with pneumatic control, and rigidly interlocked. The heat transfer from the friction surfaces is rapid for the disks are hollow and special windows are provided in the flywheel. The press has two kinds of ejectors in the slide block - rigid and spring-mounted ones, removing the work from the top die at the moment of the slide-block, starting upward. Oil lubrication is used for all gear transmissions, connecting rod ends, and worm drives of the die-space adjustment system, and grease for guides, bolsters, and bearings. Both lubrication systems are central and automatic. Four stationary control panels and one portable panel are provided for in view of the press size. There are 2 figures. [Abstracter's note: Essentially full translation]

Card 2/2

FEDORKO, A.

Studies on the relation between the age of summer swed-like rape
and infection with the larvae of *Heterodera schachtii* Schm. Bul
Ac Pol biol 10 no.6:227-228 '62.

1. Sugar Industry Institute, Warsaw. Presented by K.Petrusewicz.

*

S/076/62/036/011/019/021
B101/B180

AUTHORS: Keloglu, Yu. P., and Fedorko, A. S.

TITLE: Metallographic and x-ray diffraction studies of some pseudobinary sections in the system Cd - Zn - Sb

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 11, 1962, 2544-2547 ✓

TEXT: In the system Cd - Zn - Sb, tentative constitution diagrams were constructed for the pseudobinary sections SbZn - CdSb, Sb_2Zn_3 - CdSb, and Sb_3Zn_4 - CdSb, powder patterns of the alloys were taken, and their densities were determined. Results: (1) In the section ZnSb - CdSb (Fig. 2), the specimens 1-4 and 9-13 form a continuous series of solid solutions. The powder pattern of specimen 8, which had maximum density, showed a hexagonal lattice with $c/a = 0.83 - 0.84$. It is ascribed the formula $CdZnSb_p$. A hexagonal modification with the lattice constants $a = 4.08$ kX, $c = 2.358$ kX, $c/a = 0.725$ was found for CdSb. (2) In the section Sb_2Zn_3 - CdSb (Fig. 3), a compound is formed with 35% CdSb for

Card 1/4

2

Metallographic and x-ray diffraction...

S/076/62/036/011/019/021
B101/B180

which the composition CdZn_3Sb_3 is suggested, but the lattice was not identified. A second compound is probably formed by decomposition of Sb_2Zn_3 into $2\text{SbZn} + \text{Zn}$, and reaction of CdSb with SbZn , since the powder pattern of specimen 12 did not show CdSb or Sb_2Zn_3 lines, while those of specimens 2 and 3 corresponded to Sb_2Zn_3 , and 13, 14, and 15 to CdSb . (3) In the section $\text{Sb}_3\text{Zn}_4 - \text{CdSb}$ (Fig. 4), only a chemical compound with hexagonal lattice, $c/a \sim 0.3$, is formed. For Sb_3Zn_4 , a was found to be 10.7 kX, $c = 3.53$ kX, $c/a = 0.33$. There are 4 figures.

ASSOCIATION: Kishinevskiy gosudarstvennyy universitet (Kishinev State University)

SUBMITTED: April 9, 1962

Card 2/2

KELOGLU, Yuriy Petrovich; FEDOREKO, Anatoliy Stepanovich; SAMOSULOV, P.
red.

[Radioactive devices and their use in industry] Radioaktiv-
nye pribory, ikh primenenie v promyshlennosti. Kishinev,
Kartia moldoveniaske, 1964. 166 p. (MIRA 17:11)

ACCESSION NR: AP4031129

S/0192/64/005/002/0236/0241

AUTHOR: Keloglu, Yu. P.; Fedorko, A. S.

TITLE: X-ray structural analysis of alloys of the ZnSb-CdSb system.

SOURCE: Zhurnal strukturnoy khimii, v. 5, no. 2, 1964, 236-241

TOPIC TAGS: ZnSb CdSb system, alloy, x ray structure, zinc antimonide containing alloy, calcium antimonide containing system, solid solution, x ray powder diagram, structural parameter, Vegard law, ZnCdSb sub 2, semiconductor, p type semiconductor, electrical conductivity, thermal electromotive force

ABSTRACT: Samples of alloys of the ZnSb-CdSb system in 5 mol.% concentration increments from 0 to 100 mol% CdSb were subjected to x-ray analysis. It was found that all of the alloys are rhombic which led to the assumption of that the alloys are a continuous series of solid solutions. All the x-ray powder diagrams indicate no structural peculiarities among the alloys. Values of all three structural parameters increased with increase in CdSb content. A deviation from Vegard's law was observed in the 50 mol% CdSb range indicating the formation of an ordered solid solution or chemical compound. However if a chemical compound

Card

1/2

ACCESSION NR: AP4031129

of the ZnCdSb_2 type is formed, it is difficult to identify because of the interchangeability of the Zn and Cd. As a result of the analogous initial compounds it is assumed that chemical compounds without structural differences from ZnSb and CdSb , and also solid solutions based on them, can exist. All the samples examined are p-type semiconductors; their electric conductivity at room temperature is in the range of $10\text{--}60\text{ ohm}^{-1}\text{ cm}^{-1}$; their thermoelectromotive force is $20\text{--}400$ microvolts/degree. Orig. art. has: 1 figure and 2 tables.

ASSOCIATION: Kishinevskiy gosudarstvennyy universitet (Kishinev State University)

SUBMITTED: 13Mar63

DATE ACQ: 07May64

ENCL: 00

SUB CODE: MM

NO REF SOV: 023

OTHER: 007

Card

2/2

11771-25 EMT(m)/EWP(w)/EWA(d)/EWT(t)/EWP(b) EJP(e)/AST(a)-5/
APRTR/ESD(es) JD 1964 1967 1968 1915 1918
ACCESSION NR: AP4043578

AUTHOR: Keloglu, Yu. P.; Fedorko, A. S.

TITLE: Diagram of the pseudobinary cross section of ZnSb-CdSb.

SOURCE: Zhurnal neorganicheskoy khimii, v. 9, no. 8, 1964, 1915-1918

TOPIC TAGS: ZnSb CdSb system, x ray analysis, thermal analysis, density, microhardness, electric conductivity, solid solution, lattice parameter, pseudobinary cross section

ABSTRACT: Melts of the ZnSb-CdSb system, increasing in increments of 5 at. % CdSb, were examined with respect to density, microhardness, and electric conductivity, and were subjected to x ray analysis. The lattice parameters of the solid solutions are tabulated. The phase diagrams are the same aspect without any additional lines to indicate additional components or transitional structures. Electric conductivity curves at room temperature and 100°C showed extremes at a component ratio of 1:1, the differences in the experimental

Card 1/2

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ACCESSION NR: AP4043578

values & those in the literature were attributed to the degree of orderliness of the solid solutions which is below the sensitivity of the x ray analysis. The density and microhardness data was plotted against the percent of the solid solution containing V(Sb) content, and the microhardness data was plotted against the percent of the solid solution containing V(Sb) content. It was concluded that the solid solution represents a continuous series of solid solutions. 5 figures and 2 tables

ASSOCIATION: None

SUBMITTED: 01Jun63

ENCL: 00

SUB CODE: SS

NO REF SOV: 010

OTHER: 003

Card 2/2

TKACHENKO, A.A.; FEDORKO, Yu.F.

From experience in locating insulating damage in electric power
cables. Prom. energ. 16 no.2:17-18 F. '61. (MIRA 14:3)
(Electric lines--Testing)

FEDORKOV, G. V.

PHASE I TREASURE ISLAND BIBLIOGRAPHICAL REPORT AID 537 - I

BOOK Call No.: AF603914

Author: FEDORKOV, G. V., Kand. of Tech. Sci.

Full Title: DAMPING OF FREE VIBRATIONS OF A SYSTEM WITH MANY DEGREES
OF FREEDOM

Transliterated Title: O zatukhanii sobstvennykh kolebaniy sistem
so mnogimi stepenyami svobody

PUBLISHING DATA

Originating Agency: Moscow Institute of Railroad Transport Engineers
im. Stalin (MIIT), Trudy, Issue 76, Construction Mechanics

Publishing House: State Publishing House of Railroad Transport

Date: 1952 No. pp.: 6 (135-140) No. of copies: 1,000

Editorial Staff

Editor-in-Chief: Litvin, G. A., Kand. of Tech. Sci.

Editors: Profs., Doc. of Tech. Sci. Prokof'yev, I. P.,

Pratusevich, Ya. A., and Sinel'nikov, V. V.

Others: The preface was written by Gerasimov, A. S., Chief of MIIT,

General Director of Traffic III Rank

PURPOSE: A paper intended for engineering-technical and
scientific workers of railroad transport.

TEXT DATA

Coverage: The author explains the method of introduction of hypo-

O zatukhanii sobstvennykh kolebaniy sistem
so mnogimi stepenyami svobody

AID 537 - I

thetical outside forces proportional to the velocities of corresponding points of the system, for the determination of vibrations of systems with many degrees of freedom. Diagrams and formulae.

No. of References: Russian 4, dated 1947-1950.

Facilities: MIIT - Moskva Electromechanical Institute of Railroad Engineers.

2/2

124-58-9-10321

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 9, p 132 (USSR)

AUTHOR: Fedorkov, G. V.

TITLE: How to Account for the Decay of Free Vibrations in Systems With Many Degrees of Freedom (Ob uchete zatukhaniya pri svobodnykh kolebaniyakh sistem so mnogimi stepenyami svobody)

PERIODICAL: Tr. Mosk. in-ta inzh. zh. -d. transp., 1957, Nr 91, pp 132-142

ABSTRACT: The problem is a special case of the general problem of the calculation of the forced vibrations of elastic systems having many degrees of freedom including hysteresis losses [Sorokin, Ye. S., Issledovaniya po dinamike sooruzheniy (Investigations on the Dynamics of Structures). Stroyizdat, 1951; Pisarenko, G. S., Kolebaniya uprugikh sistem s uchedom rasseyaniya energii v materiale (Vibrations of Elastic Systems With Due Account for the Energy Dissipation Within the Material). Kiyev, Izd-vo AN UkrSSR, 1955]. The solution of the equation of the vibrations is performed by the matrix method. It is concluded that the rate of decay of the vibrations is determined only by the diagonal terms of the dissipation matrix while the adjacent terms effect only a change of the form of

Card 1/2

124-58-9-10321

How to Account for the Decay of Free Vibrations in Systems (Cont.)

the vibrations. The dissipation of the vibrational energy is accounted for by means of the viscous-friction hypothesis.

V. V. Khil'chevskiy, V. I. Shashlov

1. Vibrations--Decay
2. Vibrations--Theoretical analysis

Card 2/2

FEDORKOV, G.V., kand.tekhn.nauk, dotsent

Forced vibrations of systems taking damping into consideration.
Trudy MIIT no.131:178-189 '61. (MIRA 14:5)
(Vibration)

FEDORKOV, G.V., kand.tekhn.nauk, dotsent

Using a matrix of integration to calculate rods of varying section
for natural vibration. Trudy MIIT no.174:52-60 '63.

(MIRA 18:1)

FEDORKOV, I. A., Cand of Tech Sci -- (diss) "Investigation of the Technology of the Preparation of Previously Stressed Reinforced-Concrete Supports for a Contact Voltage System Used in the Electrification of Railroad Lines," Moscow, 1959, 13 pp (Moscow Institute of Engineers of Railraod Transport im Stalin) (KL, 2-60, 113)

BOGIN, N.M., kand. tekhn. nauk; FEDORKOV, I.A., kand. tekhn. nauk

Improving the production of I beam supports for overhead contact
systems. Transp. stroi. 14 no.10:23-25 0 '64. (MIRA 18:3)

FEDORKOV, I.A., inzh.; SHESTOPEROV, S.V., doktor tekhn.nauk; KUZNETSOV,
P.V., red.; GERASIMOVA, Ye.S., tekhn.red.

[Adhesion of stressed reinforcements to concrete; studying the
adhesion of stressed twisted and shaped reinforcements 3, 4, and
5 mm in diameter] Stseplenie napriazhennoi armatury s betonom;
issledovaniia stsepleniia napriazhennoi vitoi i profilirovannoi
armatury diametrom 3, 4 i 5 millimetrov. Moskva, Gosplanizdat,
1959. 46 p. (MIRA 13:9)

(Reinforced concrete)

YEVIANOV, G.M., inzh.; FEDORKOV, I.A., inzh.

New design of contact network supports. Transp. stroi. 9 no.11:

31-34 N '59

(Electric lines--Poles)

~~FEDORKOV, Nikolay Pavlovich~~ [Fedorkov, Mykola]; RUBYN, M., red.

[Following the main line] Na mahistral'nomy shliakhi.
Odes'ke obl.vyd-vo, 1957. 18 p. (MIRA 12:2)
(Forging)

FEDORKOV, S.G., inzh. . .

Lumber supply and woodworking establishments. Energ.stroi.
no.5:81-87 '58. (MIRA 12:5)

1. Zamestitel' glavnogo inzhenera Upravleniya promyshlennykh predpri-
yatiy.

(Volga Hydroelectric Power Station--Lumber)

FEDORKOVA, D.K.
KHANIN, M.L.; KUZNETSOVA, V.A.; ~~FEDORKOVA, D.K.~~

The role of convalescents in the epidemiology of dysentery. Zhur.
mikrobiol.epid. i immun. 29 no.3:122 Mr '58. (MIRA 11:4)

1. Iz Kubanskogo meditsinskogo instituta i I gorodskoy polikliniki.
(DYSENTERY)

CC NR: AP6034200

(A,N)

SOURCE CODE: UR/0240/66/000/010/0021/0024

AUTHOR: Fedorkova, L. V.

ORG: Saratov Scientific Research Institute for Agricultural Hygiene
(Saratovskiy nauchno-issledovatel'skiy institut sel'skoy gigiyeny)

TITLE: Working conditions during use of new sprayers

SOURCE: Gigiyena i sanitariya, no. 10, 1966, 21-24

TOPIC TAGS: spray nozzle, chemical spray tank, agricultural machinery,
plant disease control/OVT-1 spray^{CHEMICAL TANK}, OPV^{CHEMICAL TANK} spray^{CHEMICAL TANK}, OVS-2 spray^{CHEMICAL TANK}, OSS^{CHEMICAL TANK}
spray^{TANK}, ONKh^{CHEMICAL TANK} spray^{TANK}, ON-10^{CHEMICAL TANK} spray^{TANK}, ~~several other types of sprayers~~

ABSTRACT: During 1962-1963, five blower-type sprayers (OPV, OVT-1, OVS-2, OSS, ONKh) and one hydraulic hose sprayer (ON-10) developed by the L'vov State Special Construction Bureau for Machinery for Chemical Plant Protection, were tested at the Pushkin, Severo-Kavkaz, and Moldavian Machine Inspection Stations. Using standard methods, the machinery was inspected during treatment of fruit and berry crops with a spray containing 0.15% Paris green, 1% Bordeaux mixture, 0.7% DDT, and 0.1% parathion. Drivers of the tractors hauling these sprayers were often exposed to more than permissible concentrations of these poisons by inhalation and skin contact. Use of protective clothing and

UDC: 613.63:632.934.1

Card 1/2

ACC NR: AP6034200

equipment (particularly the "Lepestok" respirator), and recommendations for improvements in the design and use of this equipment are discussed.
[W.A. 50]

SUB CODE: 02,06 / SUBM DATE: 25Aug65/ ORIG REF: 002/
OTH REF: 001

Card 2/2

Fedorov Ko, M

V Polarography of some sulfur compounds. VII. Anodic depolarization in solutions of 2-mercaptobenzothiazole and 2-mercaptobenzimidazole. M. Fedorov and E. Zuman (Polarografický ústav CSAV, Prague, Czechoslovakia, 1484-93(1955); cf. C.A. 49, 11459f. — Polarographic behavior of these substances in aq. buffer solns. and in nonaq. solns.

contg. 0.5N H₂SO₄ is described. The nature of the individual waves was detd., and the adsorption phenomena of various products are stated. The behavior of both substances was compared mutually and with that of some deriva. of thiourea. The waves of both substances in 0.5N H₂SO₄ are suitable for analytical purposes. F. Stráfelda

①

Jan

Fedorov, K. M.

✓ Polarography of derivatives of urea and thiourea. VII
Some substituted ureas, thioureas, and isothioureas
by Fedorov, K. M., Manouk, and P. Zuman. Collection
1975, Chem. Commun. 21, 675. 1975. In German.
See C.A. 50 196. VIII. Anodic depolarization in solu-
tions of some 2-mercapto-4-quinazolones. Parkanyi,
and A. Vystrel. Ibid. 996. See C.A. 50 46754.

COUNTRY : Poland E-3
 CATEGORY :
 ABS. JOUR. : RZKhim., No. 5 1960, No. 17597
 AUTHOR : Fedoronko, M.
 DT. : Not given
 TITLE : The Polarographic Study of 1-Phenylacetylcarbinol and Methylbenzoylcarbinol
 ORIG. PUB. : C. em Analit, 3, No 3-4, 573-579 (1958)
 ABSTRACT : Experiments with various buffer solutions (BS) as background have been made in the course of the development of a polarographic method for the determination of 1-phenylacetylcarbinol (I) and methylbenzoylcarbinol (II). It has been established that the reduction of I at a dropping Hg electrode proceeds only in a BS of pH > 7. The $E_{1/2}$ for I in a BS which is 0.5 M in NH_3 and 0.5 M in NH_4Cl (pH 9.3-9.4) is -1.70 v. II against BS background with pH < 4.5 gives a reduction wave

CARD: 1/3

136

E-3

COUNTRY : Poland
 CATEGORY :
 17597
 ABS. JOUR. : BZhim., No. 5 1960, No.
 AUTHOR :
 INST. :
 TITLE :

IG. PUB. :

ABSTRACT : the height of which decreases at $\text{pH} > 4.5$, with the appearance of a second wave; at $\text{pH} > 7$ only the second reduction wave is observed, its height showing little dependence on the pH at $\text{pH} > 10$. In strongly alkaline media, a wave for the reduction of I appears in addition to the reduction wave for II; the former is formed as a result of the isomerization of I. The shift of the $E_{1/2}$ for I and II to more negative values depends on the nature of the cation added (the effect is in the

CARD: 2/3

COUNTRY : Poland E-3
 CATEGORY :
 ABS. JOUR. : RZKhim., No. 5 1960, No. 17597
 AUTHOR :
 INST. :
 TITLE :

IG. PUB. :

ABSTRACT : order $\text{Na}^+ < \text{K}^+ < \text{Li}^+ < \text{Ca}^{2+} < \text{CH}_3\text{NH}_3^+ < \text{NH}_4^+$) and on its concentration. The reduction of I and II is a reversible two-electron process. It has been established that in strongly alkaline and in acid solutions (0.01 M LiOH, 7-10 N HCl), the isomerization (tautomerization) reaction $\text{I} \rightleftharpoons \text{II}$ takes place (in LiOH solutions, $K_T = 0.6$; in 7-10 N HCl, $K_T = 1.8$). When a $\text{NH}_3\text{-NH}_4\text{Cl}$ BS of pH 9.3-9.4 (at 25°) is used, I and II give sharp and distinct waves.

T. Levi

CARD: 3/3

137

FEDORONKO, M.

CZECHOSLOVAKIA / Physical Chemistry. Electrochemistry. B-12

Abs Jour: Ref Zhur-Khimiya, No 23, 1958, 76833.

Author : Fedoronko, M.

Inst : ~~Not given.~~

Title : The Physicochemical Investigation of L-Phenylacetyl Carbinol and Methylbezoyl Carbinol. I. Study of the Polarographic Behavior of L-Phenylacetyl Carbinol and Methylbenzoyl Carbinol.

Orig Pub: Chem Zvesti, 12, No 1, 17-23 (1958) (in Slovak with summaries in German and in Russian).

Abstract: The author has found that L-phenylacetyl carbinol (I) in buffer solutions at $\text{pH} > 7$ gives a two-electron reducing wave, the half wave potential of which is independent of the pH. The height of the step of I varies linearly with the concentration of I; the temperature

Card 1/3

Slovenska akad. vied Bratislava, Czech.

CZECHOSLOVAKIA / Physical Chemistry. Electrochemistry. B-12

Abs Jour: Ref Zhur-Khimiya, No 23, 1958, 76833.

Abstract: coefficient of the diffusion current is 1.86% per degree. The $E\text{-log } i/(i_p - i)$ [sic] plot is linear, the slope corresponding to an apparent number of electrons $n = 1.1$. Methylbenzoyl carbinol (II) in solutions of $\text{pH} < 5$ gives a single two-electron wave with a half-wave potential which is displaced by -90 mv per unit increase in pH. At $\text{pH} > 5$ the step height decreases and at $\text{pH} 7$ the wave disappears altogether. At the same time the appearance of a second step is observed at $\text{pH} > 5$. The total height of both steps is constant and equal to the height of the first step in acid solutions. The half-wave potential of the second step is independent of the pH; at $\text{pH} > 10$ this wave begins to decrease. The half-wave

Card 2/3

59

FEDORONKO, Michael


Physical-chemical study of *l*-phenylacetylcarbinol and methylbenzoylcarbinol. II. The polarographic determination of *l*-phenylacetyl- and methylbenzoylcarbinol and benzaldehyde in the mixture. Michael Fedoronko (Slovak Acad. Sci., Bratislava, Czech). *Chem. zvesti* 12, 690-8 (1968) (German summary); cf. *C.A.* 53, 10768d. — In solns. contg. 0.5M NH₄ and 0.5M NH₄Cl, at pH 9.3, showing half-wave potentials of carbonyl forms, it was possible to det. *l*-phenylacetylcarbinol (I), mixts. of I and methylbenzoylcarbinol (II), and mixts. of I and BzH. In solns. contg. 0.025M MeNH₂ and 0.11M MeNH₄Cl, at pH 10, it was possible to det. BzH, converted to Schiff's base, in the presence of II, because, under these conditions, there was practically no condensation with MeNH₂.

JW Distr: 4820(3)

FEDORONKO, Michal, inz., C.Sc.; BERG, Hermann, dr.

Polarographic behavior of actinomycins. Chem zvesti 16 no.1/2:
28-43 Ja-F '62.

1. Ceskoslovenska akademie ved, Oddelenie fyzikalnej a analytickej
chemie Chemického ustavu Slovenskej akademie vied, Bratislava
(for Fedoronko). Fedorenko's address: Bratislava, Mlynske nivy 37,
Chemicky ustav Slovenskej akademie vied. 2. Institut fur
Mikrobiologie und experimentelle Therapie, Jena, German
Democratic Republic (for Berg). Berg's address: Jena,
Beuthenbergstrasse 11.



FEDORONKA, Michal, inz., C.Sc.; LINEK, Kazimir, inz.; PECIAR, Cyril, inz.

Potentiometric determination of the sulfuric acid and lactic acid present side by side. Chem zvesti 17 no.3:194-200 '63.

1. Chemicky ustav Slovenskej akadémie vied, Oddelenie Fyzikalnej a analytickej chémie, Bratislava, Mlynske nivy 37.

SUCHY, Jan, inz., C. Sc.; FEDORONKO, Michal, inz., C. Sc.

Preparative chromatographic separation of the mixture of phenylacetyl carbinol and methylbenzoyl carbinol. Chem zvesti 17 no.3:201-206 '63.

1. Chemicky ustav Slovenskej akademie vied, Bratislava, Dubravska cesta.

LINEK, Kazimir, inz.; PECIAR, Cyril, inz.; FEDORONKO, Michal, inz., CSc.

Determination of purine bases. Pt. 2. Chem zvesti 17 no.7:510-516 '63.

1. Chemicky ustav, Slovenska akademia vied, Bratislava, Dubravska cesta.

PEDORONKO, N.; ZUMEN, V.

Polarography of urea and thiourea derivatives. Pt. 13. Coll Cz
Chem 29 no.9:2115-2133 S '64.

1. Jaroslav Heyrovsky Institute of Polarography, Czechoslovak
Academy of Sciences, Prague. 2. Chemical Institute, Slovak Academy
of Sciences, Bratislava (Present address for Pedoronko).

L 9901-66

ACC NR: AP6003384

SOURCE CODE: CZ/0043/65/000/007/0550/0558

AUTHOR: Fedoronko, Michal --Fedoron'ko (Engineer; Candidate of sciences);
Linek, Kazimir (Engineer; Candidate of sciences)

ORG: Chemical Institute, Slovak Academy of Sciences, Bratislava (Chemicky ustav Slovenskej akademie vied)

TITLE: Determination of D-erythro-2-pentulose in the presence of D-arabinose and D-ribose

SOURCE: Chemické Zvesti, no. 7, 1965, 550-558

TOPIC TAGS: aqueous solution, spectrophotometric analysis, polarographic analysis, quantitative analysis, inorganic acid, carbohydrate

ABSTRACT: The rate of formation of furfural, and of 5-hydroxymethylfurfural from pentoses, or from hexoses in aqueous solutions of inorganic acids depends upon the reaction conditions, and upon the nature of the monosaccharide being decomposed. It was shown that among the pentoses D-erythro-2-pentulose is dehydrated in aqueous solutions of sulfuric acid much faster than D-arabinose, or D-ribose. On the basis of kinetics data for the formation of furfural, conditions for a spectrophotometric and polarographic determination of D-erythro-2-pentulose in the presence of D-arabinose and D-ribose were found. The mixture is heated on a boiling water bath in 0.4 N sulfuric acid for 15 minutes; the released furfural is determined

Cord 1/2

L 9901-66

ACC NR: AP6003384

spectroscopically at a wave length of 278 nm, or polarographically in a borate buffer solution at pH 9.3. In the limits of a content of 20-500 micrograms per milliliter the accuracy is ± 3 micrograms. The authors thank M. Salinova, A. Kisk, and A. Sedlak for technical assistance. Orig. art. has: 6 figures.

JPRS

4455
SUB CODE: 07 / SUBM DATE: 25Jan65 / ORIG REF: 001 / OTH REF: 020

RC
Card 2/2

CZECHOSLOVAKIA

FEDORONKO, M., KONIGSTEIN, J., LINEK, K.

Chemical Institute, Slovak Academy of Sciences, Bratislava - (for all).

Prague, Collection of Czechoslovak Chemical Communications, No. 12,
December 1965, pp 4297-4306

"Polarographic and preparative electroreduction of dl-glyceraldehyde
and dihydroxyacetone."
(For the 75th birthday of Academician J. Heyrovsky).

FEDOROV, A.; CHAYKA, A.; MATYUKOV, N.

Training specialists. Avt.transp. 42 no. 4:48-49 Ap '64.
(MIRA 17:5)

1. Direktor Makhachkalinskoy avtoshkly (for Fedorov).

FEDOROV, A., Engineer

Author of a series of articles on atomic energy in the following issues of Doblest': "Nuclear Energy," 9 July 1954; "Critical Weight of the Charge," 16 July 1954; "Hydrogen Bomb," 17 July 1954; and "Cobalt Bomb" and "Combat Radioactive Substances," 20 July 1954. (The 8 and 14 July 1954 issues of Doblest', not received [REDACTED], contained similar articles.)

Author of article, "What Is an Atomic Weapon?" describing in general, elementary terms, the composition and action of an atomic weapon. Sovetskaya Armiya, Group of Soviet Forces, Germany, 21 Jul 54

Author of article, "What Is an Atomic Weapon?" concerning the hydrogen and cobalt bombs. Sovetskaya Armiya, Group of Soviet Forces, Germany, 3 Aug 54

SO: SUM 291, 2 Dec 1954

NEKRASOV, K., doktor tekhn. nauk; TARASOVA, A., kand. tekhn. nauk; FEDOROV,
A., kand. tekhn. nauk

Using heatproof concrete in lining tunnel kiln cars. Stroi. mat.
4 no. 7:9-11 J1 '58. (MIRA 11:7)

(Kilns)
(Concrete)

(A.Ye.?)

RAD'KO, V., inzh.; FEDOROV, A.

Modification of the threshers of RSM-8 and S-6 combines to harvest
corn for grain. Tekh.v sel'khoz. 21 no.8:10-18 Ag '61. (MIRA 14:7)

1. Kubanskiy nauchno-issledovatel'skiy institut ispytaniya traktorov
i sel'skokhozyaystvennykh mashin.

(Combines (Agricultural machinery))
(Corn (Maize)—Harvesting)

FEDOROV, A., kand.tekhn.nauk

"Iron age"; film story about metals. Nauka i zhizn' 28 no.3:39-42
Mr '61. (MIRA 14:3)

(Motion pictures, Documentary)

FEDOROV, A. (g. Gor'kiy)

Problems of the workday during the large-scale building of
communism. Vop. ekon. no. 12:49-58 D '61. (MIRA 14:11)
(Hours of labor)

FEDOROV, A. (Kemerovo)

An exact calculation is required. Voen. znan. 40 no.12:27 D '62
(MIRA 18:1)

FEDOROV, A.

In the White-Russian sky. Av. i kosm. 45 no. 5:77 My '63.
(MIRA 16:5)

1. Byvshiy komandir 241-y bombardirovochnoy aviatsionnoy
Rechitskoy ordena Kutuzova divizii.
(World War, 1939-1945—Aerial operations)

NIKIFOROV, L.; RAKITSKIY, B.; FEDOROV, A.

Conference on the problems of building a communist economy. Vop.
ekon. no.4:140-146 Ap '63. (MIRA 16:4)
(Economics--~~Congresses~~)

FEDOROV, A. (Voronezh); ZEFIROV, V. (Sverdlovsk); TEREKHOV, N. (Moskva);
RYABCHIKOV, A. (Nizhniy Tagil)

Repaired by amateurs. Radio no.2:51 F '63,
(Television—Maintenance and repair)
(Radio—Maintenance and repair)

(MIRA 16:2)

FEDOROV, A., kand. tekhn. nauk

Outstanding scientist and public worker. NTO 5 no.11:56-58 N '63.
(MIRA 16:12)

TROFIMOV, N.; FEDOROV, A.; SEMENKOV, A.

The main thing is not hours, but hectares. Grazhd. av. 21
no.10:25 O '64. (MIRA 18:3)

1. Zamestitel' komandira Stavropol'skogo aviapodrazdeleniya po
politicheskoy chasti (for Trofimov). 2. Starshiy inzh.-ekonomist
Stavropol'skogo aviapodrazdeleniya (for Semenov).

... is needed

region before absorbing a specified radiation dose. The use of the slide rule to schedule the assignment of decontamination squads to a certain area following a explosion, is

ASSOCIATION: None

ENCL: 00

SUB CODE: CB

OTHER: 00

Card 1/1

SAVINOV, V.M.; SOKOLOV, L.B.; FEDOROV, A.A.

Effect of the acidity of diols on the hydrolytic stability of
oxalic acid polyesters. Vysokom. soed. 6 no.7:1335-1339 J1 '64
(MIRA 18:2)

1. Vladimirovskiy nauchno-issledovatel'skiy institut sinteticheskikh
smol.

BRONEVITSKIY, V.P.; VISLENEV, M.V.; ZINOV'YEVA, U.Z.; MILYUGIN, A.M.;
RASIN, B.I.; ~~FEDOROV, A.A.~~; FEDOROV, A.D.; FEDOTOVA, A.Ye.;
VOLKHOVER, R.S., tekhn. red.

[Central Museum of Communications named after A.S.Popov]
TSentral'nyy muzei svyazi imeni A.S.Popova. Leningrad,
1962. 234 p. (MIRA 15:11)

1. Russia (1923- U.S.S.R.) Ministerstvo svyazi.
(Leningrad--Communications museums)

FEDOROV, A.A.

Concerning the efficient choice of the cross section of wires
and cables. Prom. energ. 16 no.8:9-13 Ag '61. (MIRA 14:9)
(Electric cables) (Electric wire)

AVINOVITSKIY, I.Ya.; ALEKSEYEV, S.V.; BARANOV, B.M.; GEL'MAN, R.Ye.;
DVOSKIN, L.I.; DOLGINOV, A.I.; YERMILOV, A.A.; ZALESSKIY, Yu.Ye.;
KAMENEVA, V.V.; KLIMIKSEYEV, V.M.; KNYAZEVSKIY, B.A.; KUZNETSOV,
P.V.; RIVKIN, G.A.; FEDOROV, A.A.; SERBINOVSKIY, G.V., red.;
BOL'SHAM, Ya.M., red.; BRANDENBURGSKAYA, E.Ya., red.; VORONIN,
K.P., tekhn. red.

[Manual for power engineers of industrial enterprises in four
volumes] Spravochnik energetika promyshlennykh predpriyatii v
chetyrekh tomakh. Moskva, Gosenergoizdat. Vol.1. [Electric power
supply] Elektrosnabzhenie. Pod obshchei red. A.A.Fedorova, G.V.
Serbinovskogo i I.A.M.Bol'shama. 1961. 840 p. (MIRA 15:6)
(Electric engineering)

FEDOROV, A.A.; BOL'SHAKOV, A.Yu.; SOKOLOV, M.M.; NATSVIN, A.N.;
PAVLYUKOVICH, Ye.A.

Principal results of work on using the gamma-ray scattering
method in a Central Asian mercury mine. Uch. zap. SAIGIMSa
no.8:53-58 '62. (MIRA 17:1)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut razvedochnoy
geofiziki i Yuzhnyy gornometallurgicheskiy kombinat im. Frunze.

FEDOROV, A.A., veterin. vrach; MAL'TSEVA, G.A., veterin. vrach

Practices in the preparation and use of PMS. Veterinariia 41
no.2:82-83 F '64. (MIRA 17:12)

1. Ussuriyskoye proizvodstvennoye upravleniye, Primorskiy kray.

FEDOROV, A.A.

Outbreak of theileriasis in cattle in fall. Veterinariia 42
no.10:44 0 '65. (MIRA 18:10)

1. Glavnyy veterinarnyy vrach Ussuriyskoy veterinarnoy stantsii
po bor'be s boleznyami sel'skokhozyaystvennykh zhivotnykh.

~~FIODOROV, A. A.~~ FIODOROV, A. A.
FIODOROV, A. A.

"Asymptotic Solution of Diffraction Problem of Electromagnetic Waves on
Certain Solids of Revolution."

paper presented at the 4th All-Union Conf. on Acoustics, Moscow, 26 May - 2 Jun 58.

SOV/109-3-12-4/13

AUTHOR: Fedorov, A.A.

TITLE: Asymptotic Solution of the Problem of Deformation of a Plane Electromagnetic Wave on an Ideally Conducting Sphere
(Asimptoticheskoye resheniye zadachi o difraktsii ploskoy elektromagnitnoy volny na ideal'no provodyashchey sfere)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol 3, Nr 12,
pp 1451 - 1462 (USSR)

ABSTRACT: The accurate solution of this problem leads to a complex series which is difficult to evaluate. The problem can be solved approximately by employing an asymptotic solution based on the methods proposed by V.A. Fok. The aim of the paper is to give comparatively simple formulae which can be used for the observation angles θ lying within an interval $0 \leq \theta < \pi$ and formulae for angles $\theta \approx \pi$. If a rectangular co-ordinate system (x, y, z) and a spherical co-ordinate system (R, θ, φ) are adopted, as shown in Figure 1, and if the plane wave impinging on the sphere is given by:

$$E_x^0 = -H_y^0 = e^{-ikz} \quad (1),$$

the exact solution of the diffraction problem for the

Card 1/5

SOV/109-3-12-4/13

Asymptotic Solution of the Problem of Deformation of a Plane
Electromagnetic Wave on an Ideally Conducting Sphere

scattered wave is:

$$E_{\theta} = \frac{e^{ikR}}{ikR} \cos \varphi \left(-\frac{d^2 S_2}{d\theta^2} + \frac{1}{\sin \theta} \frac{dS_1}{d\theta} \right), \quad (2)$$

$$E_{\varphi} = \frac{e^{ikR}}{ikR} \sin \varphi \left(\frac{1}{\sin \theta} \frac{dS_2}{d\theta} - \frac{d^2 S_1}{d\theta^2} \right).$$

The parameters S_1 and S_2 in Eqs (2) are expressed by Eqs (3), where ψ_n and ζ_n are spherical Bessel functions which can be determined from Eq (4), while P_n are the Legendre polynomials. For $\theta < \pi$, the parameters S_1 and S_2 can be expressed in the form of Eqs (7) or finally

SOV/109-3-12-4/13

Asymptotic Solution of the Problem of Deformation of a Plane
Electromagnetic Wave on an Ideally Conducting Sphere

by Eqs (12). Each of the coefficients S_1 and S_2 can be expressed as a sum of two components, as shown in Eqs (14). These, in turn, can be expressed by Eqs (15) and (16). The first components of Eqs (14) can also be represented in the form of Eqs (19). Now, the diffracted field components can be determined on the basis of the geometrical optics approximation and are in the form of Eqs (20). These should be corrected by employing the first components of the coefficients S_1 and S_2 and it is shown that the corrections are expressed by Eqs (24), where w_1 and w_2 are Airy functions. The corrections can finally be expressed in the forms of Eqs (34), where the functions g and f are defined by Eqs (26) and (27). When $\theta \approx \pi$, an approximate solution can be obtained by employing the vector-potential method. For the purpose of this calculation, it is assumed that the co-ordinates at the surface of the sphere are α , θ_1 and φ_1 while the co-ordinates of the observation point are R , θ and φ .

Card3/5

SOV/109-3-12-4/13

Asymptotic Solution of the Problem of Deformation of a Plane
Electromagnetic Wave on an Ideally Conducting Sphere

The field components are shown to be in the form of Eqs (40), where e_0 and e_φ are expressed by Eqs (41). These functions can also be represented by Eqs (48) or, finally, by Eqs (52). The above analytical formulae were employed to plot the graphs of the functions e_θ and e_φ and these are shown in Figures 4, 5, 6, 7. Curves designated by 1 are evaluated by using the accurate formulae (see Eqs (2)), curves denoted by 2 are evaluated by Eqs (52), while Curves 3 are calculated by using the geometrical-optical approximation and the corrections as defined by Eq (34). From the graphs, it is seen that, in general, the approximation formulae are sufficiently accurate. The author expresses his gratitude to L. A. Vaynshteyn for directing this work.

Card 4/5

SOV/109-3-12-4/13

Asymptotic Solution of the Problem of Deformation of a Plane
Electromagnetic Wave on an Ideally Conducting Sphere

There are 7 figures and 6 references, 5 of which are
Soviet and 1 German.

SUBMITTED: March 23, 1957

Card 5/5